REPORT:

5th CEFSER training course
"Analysis of chemical contaminants in food and the environment"

Fifth CEFSER training course was organized from May 07 to May 11, 2012 by the Faculty of Technology, University of Novi Sad, Novi Sad, Serbia. The Course is organized as an open-access event for researchers, PhD and postdoc students, and all other from Western Balkan Countries (WBCs) who are involved in the issues of chemical contaminants in food and the environment. It was also organized as a training session for the CEFSER team members sharing the knowledge with the colleagues from the prestigious institutions from the EU Member States and Associated Countries.

The major contribution to this event, taking into account the number of presentations, was given by the CEFSER team members, representing the achievement of the CEFSER Lab and transferring the gained knowledge in the domain of food safety and environmental monitoring to the audience from the Western Balkan Countries: Croatia, Macedonia, Albania, and Serbia. Moreover, the representatives of the CEFSER supporting partners and also the researchers with prestigious knowledge and expertise from EU Member States and from the Associated Countries contributed to the Course by presenting the latest trends and knowledge in the area of chemical contaminants in food and the environment and their analysis.

Opening presentation of Prof. Biljana Škrbić, the CEFSER coordinator: "CEFSER resources and activities"

The Course Program was divided into theoretical and practical sessions covering different chemical contaminants of food and the environment: heavy elements, mycotoxins, semi-volatile organic compounds, including polycyclic aromatic hydrocarbons (PAHs) and emerging pollutants like perfluorinated compounds (PFCs). Practical sessions were organized and presented by the CEFSER team members. Participants got the handouts prepared for each practical sessions.

The program started with the presentation of Prof. Biljana Škrbić, the project coordinator, entitled "CEFSER resources and activities" about the capacities of the CEFSER Lab and the research that has been conducted by the CEFSER team members and the achieved results. Afterwards, Prof. Škrbić gave an overview of the chemical contaminants in food, the EC regulation and trends in the analytical procedures for food safety.

Prof. Trajče Stafilov from Institute of Chemistry, Faculty of Science and Mathematics, Sts. Cyril and Methodius University, Republic of Macedonia, gave very interesting lecture on "Monitoring of the pollution with heavy metals using INAA, ICP-AES and AAS: The results from the studies in the Republic of Macedonia"

The rest of the first day was dedicated to the heavy elements occurrence in food and the environment, including their levels, relevant regulation and analytical procedures, whereas the results of the heavy element analysis in the CEFSER Lab was also presented. In this session, Prof. Škrbić and Jelena Živančev, the researcher employed through CEFSER, gave the presentations on the mentioned subjects. The scientific activities were ended by the first practical session covering the microwave digestion of samples as a preparatory step for the heavy element analysis in food and environmental samples. After that, Get Together party was organized to make participants to be more familiar with each other having possibility to exchange their interest and knowledge.

The second day of the Course started with lecture of Prof. Trajče Stafilov from Institute of Chemistry, Faculty of Science and Mathematics, Sts. Cyril and Methodius University, Republic of Macedonia, entitled "Monitoring of the pollution with heavy metals using INAA, ICP-AES and AAS: The results from the studies in the Republic of Macedonia". Prof. Stafilov has significant background and publication record in the area of heavy element analysis in wide range of samples. He also gave valuable suggestions and tips to the CEFSER team members about the heavy element analysis by graphite furnace atomic absorption spectrometry (GFAAS) – instrumental technique available for heavy element analysis in the CEFSER Lab, and invited them to visit the lab in Skopje in order to share the knowledge in this area of analysis.

Detail from one of the practical sessions organized by the CEFSER team during the 5th CEFSER Training Course

The morning session on May 08 was ended with the second practical session dedicated to GFAAS conducted in the CEFSER Lab, while with the afternoon session the attention was shifted to the organic pollutants. Namely, Ana Tjapkin, another researcher employed by CEFSER, involved in development of analytical procedures for determination of various organic pollutants in the CEFSER Lab gave the presentation "Analysis of organic pollutants by ultra high performance liquid chromatography coupled to mass spectrometer", which was an intro to two following presentations: "Application of UHPLC-MS in food authenticity" by Prof. Dr. Živoslav Tešić, University of Belgrade, Faculty of Chemistry, Belgrade, and "Mycotoxins: occurrence, legislation and analysis," given by Prof. B. Škrbić.

The morning session of the third day, May 09, was dedicated to the results of the mycotoxin analysis performed in the CEFSER Lab presented by Prof. B. Škrbić, followed by the practical sessions demonstrating the preparatory and analytical protocols, based on the analysis of crude extracts by ultra high performance liquid chromatography coupled to tandem mass spectrometry (UHPLC-MS/MS) developed for determination of mycotoxins in cereals in the CEFSER Lab.

Dr. Philippe Verlinde from Institute of Reference Materials and Measurements (IRMM), Geel, Belgium, opened the afternoon session of the third day with an overview of the EU-RL activities and outcomes of the interlaboratory studies organized by IRMM. Then, Dr. Verlinde gave a very interesting presentation about the advanced protocols for determination of PAHs in food based on application of liquid chromatography coupled to mass spectrometry. This was also a base of fruitful discussion with CEFSER team members involved in UHPLC-MS/MS analysis (with atmospheric pressure photoionisation, APPI) of PAHs and the knowledge sharing.

The forth day (May 10) was more relaxed: in the morning there was a practical session dedicated to the analysis of PAHs by UHPLC-APPI-MS/MS, followed by the excursion organized in the vicinity of Novi Sad in order to introduce the Course participants with the cultural and historical monuments of the region. In the evening, official dinner was organized for all participants.

Grantholders of 5th CEFSER Training Course with Prof. Dr. Biljana Škrbić

The fifth day of Course (May 11) started with presentation on semi volatile compounds, their sources and levels in food and the environment, given by Nataša Đurišić-Mladenović, followed by the presentations of the guest lecturers from the institutions supporting the CEFSER project. Franciska Perez from Institute for Environmental Assessment and Water Research, Spanish Council for Scientific Research, Barcelona, Spain, gave an oral presentation on "Emerging pollutants: sources and occurrence of perfluorinated compounds", presenting also results on the occurrence of perfluorinated compounds (PFCs) in the Serbian food, primarily baby food, provided by the CEFSER team. In fact, these results represent the first result ever obtained for the Serbian food and PFCs. Afterwards, Dr. Jon E. Johansen, director of CHIRON from Trondheim, Norway, presented standards of perfluorinated compounds and raise the interest of the participants on the availability of wide range of certified materials for analytical chemicstry.

After overview of the performed activities, the 5th CEFSER Training Course was closed with ceremony of the awards of certificates.

In total there were 58 participants attending the 5th CEFSER training course. Six of them (coming from Albania, Croatia and Serbia) were awarded by the CEFSER grant, to whom the accommodation and travel costs were fully reimbursed by the CEFSER project. Participants were from the following institutions:

- Institute of Public Health of Vojvodina, Novi Sad, Serbia
- Institute of Food Technology, Novi Sad, Serbia
- Department of Environmental Engineering and Occupational Safety and Health, Faculty of Technical Sciences, Novi Sad, Serbia
- University of Novi Sad, Faculty of Sciences, Novi Sad, Serbia
- IChTM-Centre of Chemistry, University of Belgrade, Belgrade, Serbia
- CHIRON, Trondhaim, Norway
- Croatian Geological Survey, Zagreb, Croatia
- Rudjer Boskovic Institute, Zagreb, Croatia
- University of Tirana, Faculty of Natural Sciences, Tirana, Albania
- Institute for occupational protection, Novi Sad, Serbia
- University of Novi Sad, Faculty of Medicine, Novi Sad, Serbia
- University of Belgrade, Faculty of Chemistry, Belgrade, Serbia
- A Bio Tech Lab D.O.O, Sremska Kamenica, Serbia
- Faculty for Physical Chemistry, University of Belgrade, Belgrade, Serbia
- Department of Environmental Chemistry Institute os Environmental Assessment and Water Research (IDAEA-CSIC), Barcelona, Spain
- University of Novi Sad, Faculty of Medicine, Department of Pharmacology, Toxicology and Clinical Pharmacology, Novi Sad, Serbia
- Institute of Chemistry, Faculty of Science and Mathematics, Sts. Cyril and Methodius University, Republic of Macedonia
- SP Laboratorija, Bečej, Serbia
- Institute for Reference Materials and Measurements, Geel, Belgium

Thus, apart of the theoretical and practical sessions, the participants had the opportunity to get to know each other better through social events organized and included in the program of the course, Get Together party (May 7), lunches (May 7-11), excursion (May 10) and the official dinner (May 10).

Participants of the 5th CEFSER Training Course

PROGRAM

5th CEFSER Training Course

Analysis of chemical contaminants in food and the environment

organized within the FP7-CEFSER project coordinated by the Faculty of Technology, University of Novi Sad, Novi Sad, Republic of Serbia

7-11 May 2012

7 May 2012

9.30-10.00 *Registration*

10.00-10.05 Welcome speech

10.05-10.40 CEFSER resources and activities, ***Prof. Dr. Biljana Škrbić,*** *University of Novi Sad, Faculty of Technology, Novi Sad, Serbia*

10.40-11.15 Chemical contaminants in food, ***Prof. Dr. Biljana Škrbić,*** *University of Novi Sad, Faculty of Technology, Novi Sad, Serbia*

11.15-11.45 *Coffee break*

11.45-12.15 Analysis of heavy elements in food and environmental samples: principles behind atomic absorption spectrometry, ***Prof. Dr. Biljana Škrbić, Jelena Živančev,*** *University of Novi Sad, Faculty of Technology, Novi Sad, Serbia*

12.15-14.30 *Lunch break*

14.30-15.30 Results on heavy elements analysis in CEFSER Lab, ***Prof. Dr. Biljana Škrbić,*** *University of Novi Sad, Faculty of Technology, Novi Sad, Serbia*

15.30-16.00 Sample preparation for heavy element analysis: principles behind microwave digestion, ***Prof. Dr. Biljana Škrbić, Jelena Živančev,*** *University of Novi Sad, Faculty of Technology, Novi Sad, Serbia*

16.00-16.30 *Coffee break*

16.30-18.30 Practical session I: Microwave digestion of samples, ***CEFSER team members***

19.00-21.00 *Get together*

8 May 2012

9.00-10.30 Monitoring of the pollution with heavy metals using INAA, ICP-AES and AAS: The results from the studies in the Republic of Macedonia, ***Prof. Dr. Trajče Stafilov,*** *Institute of Chemistry, Faculty of Science and Mathematics, Sts. Cyril and Methodius University, Republic of Macedonia*

10.30-11.00 Coffee break

11.00-13.00 Practical session II: Analysis of heavy elements by atomic absorption spectrometer with graphite furnace, ***CEFSER team members***

13.00-15.00 Lunch break

15.00-16.00 Analysis of organic pollutants by ultra high performance liquid chromatography coupled to mass spectrometer, ***Prof. Dr. Biljana Škrbić, Nataša Đurišić-Mladenović, Ana Tjapkin,*** *University of Novi Sad, Faculty of Technology, Novi Sad, Serbia*

16.00-17.00 Application of UHPLC-MS in food authenticity, ***Prof. Dr. Živoslav Tešić,*** *University of Belgrade, Faculty of Chemistry, Belgrade, Serbia*

17.00-17.30 Coffee break

17.30-18.30 Mycotoxins: occurrence, legislation and analysis, ***Prof. Dr. Biljana Škrbić,*** *University of Novi Sad, Faculty of Technology, Novi Sad, Serbia*

9 May 2012

9.00-10.00 Results on UHPLC-MS/MS analysis of mycotoxins in CEFSER Lab, ***Prof. Dr. Biljana Škrbić,*** *University of Novi Sad, Faculty of Technology, Novi Sad, Serbia*

10.00-12.00 Practical session III: Crude extract based method for mycotoxins analysis, ***CEFSER team members***

12.00-12.30 Coffee break

12.30-14.00 Practical session IV: Analysis of mycotoxins by UHPLC-MS/MS, ***CEFSER team members***

14.00-15.30 Lunch break

15.30-16.30 Overview of the EU-RL activities and outcomes of the interlaboratory studies organized by IRMM, ***Dr. Philippe Verlinde****, Institute for Reference Materials and Measurements (IRMM), Geel, Belgium*

16.30-17.00 Coffee break

17.00-18.00 Analysis of polycyclic aromatic hydrocarbons (PAHs) by LC-MS, ***Dr. Philippe Verlinde,*** *Institute for Reference Materials and Measurements (IRMM), Geel, Belgium*

10 May 2012

8.30-11.00 Practical session V: Analysis of PAHs by UHPLC-APPI-MS/MS, ***CEFSER team members***

11.00 *Excursion*

19.00-21.00 *Dinner*

11 May 2012

9.00-10.00 Semi-volatile organic pollutants: sources and occurrence in food and the environment, ***Prof. Dr. Biljana Škrbić, Nataša Đurišić-Mladenović,*** *University of Novi Sad, Faculty of Technology, Novi Sad, Serbia*

10.00-11.00 Emerging pollutants: sources and occurrence of perfluorinated compounds, *Lecturer to be announced,* ***Franciska Perez,*** *Institute for Environmental Assessment and Water Research, Spanish Council for Scientific Research, Barcelona, Spain*

11.00-11.30 *Coffee break*

11.30-12.30 Standards of perfluorinated compounds, ***Dr. Jon E. Johansen,*** *CHIRON, Trondheim, Norway*

12.30-14.00 *Lunch break*

14.00-14.20 Brief resume of the course

14.20-15.00 Closing ceremony with awards of certificates